CLAIMS AMENDMENTS AND CLAIMS LISTING:

1.   (Currently Amended)   A method of fault classification in a plasma process chamber powered by an RF source, comprising the steps of:

(a) running a plurality of baseline processes of different types on the chamber,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process, and

(c) when a fault is to be classified, repeating ~~at least~~ more than one of the said baseline process types according to a predetermined decision tree to classify the fault by comparing the current magnitudes of the said Fourier components with the corresponding reference data.

2.   (Canceled)

3.   (Canceled)

4.   (Canceled)

5.   (Canceled)

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6.   (Canceled)

7.   (Canceled)

8.   (Canceled)

9.   (Canceled)

10.   (Canceled)

11.   (New) A method of fault classification in a plasma process chamber powered by an RF source, comprising the steps of:

(a) running a plurality of baseline processes of different types on the chamber,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process,

(c) when a fault is to be classified, repeating at least one of the said baseline process types according to a predetermined decision tree to classify the fault by comparing the current magnitudes of the said Fourier components with the corresponding reference data, and

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wherein steps (a) and (b) are performed prior to scheduled downtime of the chamber and step (c) is performed after the scheduled downtime and prior to a production run.

12. (New) A method of fault classification in a plasma process chamber powered by an RF source, comprising the steps of:

(a) running a plurality of baseline processes of different types on the chamber, wherein the baseline processes of different types comprise a first baseline process including the same gases as those used in a production run for which the chamber is used, a second baseline process running an inert gas plasma, and a third baseline process running at sufficiently low power that no plasma ignites,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process, and

(c) when a fault is to be classified, repeating at least one of the said baseline process types according to a predetermined decision tree to classify the fault by comparing the current magnitudes of the said Fourier components with the corresponding reference data.

13. (New) A method of comparing two plasma process

chambers powered by an RF source, comprising the steps of:

(a) running a plurality of baseline processes of different types on one of the chambers,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process,

(c) running at least one of the said baseline process types on the other chamber according to a predetermined decision tree to classify any differences between the chambers by comparing the current magnitudes of the said Fourier components with the corresponding reference data, and

wherein steps (a) and (b) are performed prior to scheduled downtime of the chamber and step (c) is performed after the scheduled downtime and prior to a production run.

14.   (New)   A method of comparing two plasma process chambers powered by an RF source, comprising the steps of:

(a) running a plurality of baseline processes of different types on one of the chambers, wherein the baseline processes of different types comprise a first baseline process including the same gases as those used in a production run for which the chamber is used, a second baseline process running an inert gas plasma, and a third baseline process running at sufficiently low

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power that no plasma ignites,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process, and

(c) running at least one of the said baseline process types on the other chamber according to a predetermined decision tree to classify any differences between the chambers by comparing the current magnitudes of the said Fourier components with the corresponding reference data.

15. (New) A computer-readable storage medium bearing program code adapted in execution on a computer to perform the following steps on a plasma process chamber powered by an RF source:

(a) run a plurality of baseline processes of different types on the chamber,

(b) in respect of each said baseline process, determine the magnitudes of a plurality of Fourier components of delivered RF power and store the magnitudes as reference data for that baseline process,

(c) when a fault on the chamber is to be classified, repeat at least one of the said baseline process types according to a predetermined decision tree to classify the fault by comparing

the current magnitudes of the said Fourier components with the corresponding reference data, and

wherein steps (a) and (b) are performed prior to scheduled downtime of the chamber and step (c) is performed after the scheduled downtime and prior to a production run.

16. (New) A computer-readable storage medium bearing program code adapted in execution on a computer to perform the following steps on a plasma process chamber powered by an RF source:

(a) run a plurality of baseline processes of different types on the chamber, wherein the baseline processes of different types comprise a first baseline process including the same gases as those used in a production run for which the chamber is used, a second baseline process running an inert gas plasma, and a third baseline process running at sufficiently low power that no plasma ignites,

(b) in respect of each said baseline process, determine the magnitudes of a plurality of Fourier components of delivered RF power and store the magnitudes as reference data for that baseline process, and

(c) when a fault on the chamber is to be classified, repeat at least one of the said baseline process types according to a predetermined decision tree to classify the fault by comparing

the current magnitudes of the said Fourier components with the corresponding reference data.